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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,251	02/27/2004	Ian McGregor Slothers		1337

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WASHINGTON, DC 20036

EXAMINER	
LE, JOHN H	
ART UNIT	PAPER NUMBER
2863	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/787,251	SLOTHERS ET AL.	
	Examiner	Art Unit	
	John H. Le	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-66 and 68-81* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *38-58,64,65 and 70-72* is/are allowed.

6)☒ Claim(s) *1-5,7,8,19,21-23,25,26,59-63,66,68,69 and 73-81* is/are rejected.

7)☒ Claim(s) *6,9-18,24 and 27-37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/30/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 06/30/2006 has been entered.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 66, 68, 69, 77-81 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are directed to a judicial exception; as such, pursuant to the Interim Guidelines on Patent Eligible Subject Matter (MPEP 2106), the claims must have either physical transformation and/or a useful, concrete and tangible result. The claims fail to include transformation from one physical state to another. Although, the claims appear useful and concrete, there does not appear to be tangible result claimed.

Regarding claims 66, 68, merely performing a comparison using said fifth, sixth, seventh and eighth parameters to determine said value or performing a comparison using one or more components or derivatives of said fifth, sixth, seventh and eighth parameters to determine said value and using said value to identify said device would

not appear to be sufficient to constitute a tangible result, since the outcome of the using step has not been used in a disclosed practical application nor made available in such a manner that it's usefulness in a disclosed practical application can be realized (e.g., in some instances, if it was "conveyed to someone" or "display" or "stored by user", that would establish a tangible result). Therefore, claim(s) 66, 68 appear(s) non-statutory.

Regarding claim 69, merely comparing at least one of said parameters for said device with corresponding at least one parameters for at least one other device to identify said device would not appear to be sufficient to constitute a tangible result, since the outcome of the comparing step has not been used in a disclosed practical application nor made available in such a manner that it's usefulness in a disclosed practical application can be realized (e.g., in some instances, if it was "conveyed to someone" or "display" or "stored by user", that would establish a tangible result). Therefore, claim(s) 69 appear(s) non-statutory.

Regarding claims 77-81, merely identifying the device in dependence upon the predefined inequality relationship would not appear to be sufficient to constitute a tangible result, since the outcome of the identifying step has not been used in a disclosed practical application nor made available in such a manner that it's usefulness in a disclosed practical application can be realized (e.g., in some instances, if it was "conveyed to someone" or "display" or "stored by user", that would establish a tangible result). Therefore, claim(s) 77-81 appear(s) non-statutory.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 7-8, 19-23, 25-26, and 59-64 are rejected under 35 U.S.C. 103(a) as obvious over Slates et al. (US 2003/0222639).

Regarding claims 1, 59, Slates et al. teach an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device (e.g. Figs.1-2), the apparatus comprising: a load component (40) having a known impedance or at least one component thereof for connection in series with said device (e.g. Figs.1, 10, [0085]); a signal generating (70) arrangement for generating an electrical signal for application to the series connected load component and device (e.g. Fig.1, [0087], [0091]); a measurement channel for measuring voltages (e.g. [0277]-[0278]); and a processing arrangement connected to said measurement channel for processing the sequentially measured voltages to generate an output dependant upon said impedance or said at least one component of impedance of said device (e.g. [0191]).

Although Slates et al. is silent on the teaching of a switch arrangement connected to said measurement channel for switching the measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component, however it would have been obvious to one of ordinary skill at the

time the invention was made to teach a switch arrangement connected to said measurement channel for switching the measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component since the system 10 measures the impedance of the proximity probe 12 by using open/short calibration method (e.g. Figs.11-13) to measure a first voltage (V1) and a second voltage (V2) of the proximity probe 12 (e.g. Figs.11-13, [0135]-[0138]).

Regarding claims 19, 60, 61-63, Slates et al. teach a method of generating an output dependent upon the impedance or at least one component of the impedance of a device (e.g. Figs. 11-14, [0191]), the method comprising: connecting a load component having a known impedance or at least one component thereof in series with said device (e.g. Figs. 11-14); applying an electrical signal to the series connected load component and device (e.g. [0160],[0162]); and processing the sequentially measured voltages to generate an output dependent upon said impedance or at least one component of the impedance of said device (e.g. [0191]).

Although Slates et al. is silent on the teaching of using a measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component, however it would have been obvious to one of ordinary skill at the time the invention was made to teach using a measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across

said load component for purpose of obtaining an output dependent upon the impedance or at least one component of the impedance of a device since the system 10 measures the impedance of the proximity probe 12 by using measure a first voltage (V1) and a second voltage (V2) of the proximity probe 12 (e.g. Figs.11-13, [0135]-[0138]).

Regarding claims 2 and 20, Slates et al. teach said signal is generated as a signal comprising sequential signal blocks for application to said series connected load component and device (e.g. [0093]), wherein said measurement channel is used to measure each of said voltages during the same part of the signal block of sequential signal blocks of said signal (e.g. [0017]).

Regarding claims 3 and 21, Slates et al. teach storing a signal pattern for at least a part of a signal block, digitally generating a digital signal by repeatedly using the stored signal pattern (e.g. [0103]), and digital-to-analogue converting the digital signal to generate the signal (e.g. D/A converter 140, Fig.1).

Regarding claims 4 and 22, Slates et al. teach the signal generation and the processing are synchronous (e.g. [0278]).

Regarding claims 5 and 23, Slates et al. teach using a plurality of said measurement channels for measuring said voltages, using each of said measurement channels to sequentially measure said voltages to allow simultaneous measurements in the measurement channels, and processing the sequentially measured voltages for each channel (e.g. [0093]).

Regarding claims 7 and 25, Slates et al. teach processing generates the output as a measure of impedance or at least one component of the impedance of said device (e.g. [0191]).

Regarding claims 8 and 26, Slates et al. teach generate said output as an indication of whether or not a factor related to the impedance or at least one component thereof is above or below a threshold (e.g. [0257]).

6. Claims 73-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slates et al. (US 2003/0222639) in view of Macbeth et al. (US 2003/0156367 A1).

Regarding claims 73, 75, Slates et al. teach a method and apparatus of generating an output dependent upon the impedance or at least one component of the impedance of a device (e.g. Figs. 11-14, [0191]), the method comprising: connecting a load component having a known impedance or at least one component thereof in series with said device allow for the measurement of a voltage drop across the load component (e.g. Figs. 11-14); applying voltage across to the series connected load component and device (e.g. [0160],[0162]); and processing the sequentially measured voltages to generate an output dependent upon said impedance or at least one component of the impedance of said device (e.g. [0191]).

Although Slates et al. is silent on the teaching of using a measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component, however it would have been obvious to one of ordinary skill at the time the invention was made to teach using a measurement channel to

sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component for purpose of obtaining an output dependent upon the impedance or at least one component of the impedance of a device since the system 10 measures the impedance of the proximity probe 12 by using measure a first voltage (V1) and a second voltage (V2) of the proximity probe 12 (e.g. Figs.11-13, [0135]-[0138]).

Slates et al. fail to teach monitor said measurements to detect fault conditions in said device and to output a warning output if a fault condition is detected.

Macbeth et al. teach monitor said measurements to detect fault conditions in said device and to output a warning output if a fault condition is detected (e.g. [0028].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include monitor said measurements to detect fault conditions in said device and to output a warning output if a fault condition is detected as taught by Macbeth et al. in a method and apparatus of generating an output dependent upon the impedance or at least one component of the impedance of a device of Slates et al. for the purpose of providing an electrical protection device which protects an electrical power distribution system supplying voltage from a secondary winding of a transformer through an electrically conductive path to the protection device includes an impedance detector which measures the impedance of the path (Macbeth et al., Abstract).

Regarding claims 74, 76, Macbeth et al. teach detects a fault condition when at least one said measurement is outside a predetermined threshold or range (e.g. [0006]-[0008]).

Allowable Subject Matter

7. Claims 38-58, 64-65, and 70-72 are allowed.

8. Claims 6, 9-18, 24, 27-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a processing arrangement connected to said measurement channel for processing the sequentially measured voltages to generate an output dependent upon said impedance or said at least one component of impedance of said device, wherein the apparatus including a plurality of said measurement channels for measuring said voltages, wherein said switching arrangement is adapted to switch each of said measurement channels to sequentially measure said voltages to allow simultaneous measurements in the measurement channels, and said processing arrangement is adapted to process the sequentially measured voltages for each channel, processing arrangement is adapted to determine an estimate of noise in the measurements using averages of said third and fourth parameters over a plurality of measurements, and to ignore the current comparison of said third and fourth parameters if said noise is above a threshold. It is these limitations as they are claimed in the combination with other limitations of claim,

which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 9, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a processing arrangement connected to said measurement channel for processing the sequentially measured voltages to generate an output dependant upon said impedance or said at least one component of impedance of said device, wherein said processing means is adapted to generate said output as an indication of whether or not a factor related to the impedance or at least one component thereof is above or below a threshold, and wherein said processing arrangement is adapted to: determine a first parameter indicative of the complex amplitude of the first voltage on a first side of said load component connected to said device, and a second parameter indicative of the complex amplitude of the difference between the first and second voltages or said voltage difference; multiply each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively; and compare said third and fourth parameters to generate said output, or compare one or more components or derivatives of the third parameter and one or more components or derivatives of said fourth parameter to generate said output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 15, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a processing arrangement connected to said measurement channel for processing the sequentially measured voltages to generate an output dependant upon said impedance or said at least one component of impedance of said device, wherein said processing means is adapted to generate said output as an indication of whether or not a factor related to the impedance or at least one component thereof is above or below a threshold, and wherein said signal generating arrangement is adapted to generate said electrical signal comprising a plurality of frequency components and said processing arrangement is adapted to determine a first parameter indicative of the complex amplitude of the first voltage on said first side of said load component for each said frequency, and a second parameter indicative of the complex amplitude of the difference between the first and second voltages or said voltage difference for each said frequency, to multiply each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively, and to compare said third and fourth parameters to generate said output, or compare one or more components or derivatives of the third and fourth parameters to generate said output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 18, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a processing arrangement connected to said measurement channel for processing the sequentially measured voltages to generate an output dependant upon said impedance or said at least one component of impedance of said device, wherein said processing means is adapted to generate said output as an indication of whether or not a factor related to the impedance or at least one component thereof is above or below a threshold, and processing arrangement is adapted to determine an estimate of noise in the measurements using averages of said third and fourth parameters over a plurality of measurements, and to ignore the current comparison of said third and fourth parameters if said noise is above a threshold. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 24, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, the method comprising: using a measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component; and processing the sequentially measured voltages to generate an output dependent upon said impedance or at least one component of the impedance of said device, wherein said processing comprises

digital processing, and said measurement channels include a common multiplexer arrangement and a common analogue-to-digital converter. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 27, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, the method comprising: processing the sequentially measured voltages to generate an output dependent upon said impedance or at least one component of the impedance of said device, wherein said processing includes determining a first parameter indicative of the complex amplitude of the first voltage on a first side of said load device connected to said device, and a second parameter indicative of the complex amplitude of a difference between the first and second voltages or said voltage difference; multiplying each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively; and comparing said third and fourth parameters to generate said result. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 33, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, the method comprising: applying an

electrical signal to said electrical arrangement to generate said parameters; processing the sequentially measured voltages to generate an output dependent upon said impedance or at least one component of the impedance of said device, wherein the processing generates said output a an indication of whether or not a factor related to the impedance or at least one component of the impedance is above or below a threshold, and wherein said electrical signal comprises a plurality of frequency components and said processing includes determining a first parameter indicative of the complex amplitude of the first voltage on said first side of said load component for each said frequency, and a second parameter indicative of the complex amplitude of the difference between the first and second voltages or said voltage difference for each said frequency, multiplying each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively, and comparing said third and fourth parameters to generate said output, or comparing one or more components or derivatives of the third and fourth parameters to generate said output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 38, none of the prior art of record teaches or suggests the combination of apparatus for generating an output dependent upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a signal processing arrangement for processing the measurements to generate an output dependent upon the impedance or at least one component of the impedance of the

device, wherein said processing arrangement is adapted to: determine a first parameter indicative of the complex amplitude of the first voltage on a first side of said load component connected to said device, and a second parameter indicative of the complex amplitude of said difference voltage or a calculated difference voltage comprising the difference between the first and second voltages; multiply each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively; and compare said third and fourth parameters to generate an output or compare one or more components or derivatives ofthe third parameter and said fourth parameter to generate said output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 48, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, the method comprising: processing the measurements to generating an output dependent upon the impedance or at least one component thereon wherein said processing comprises: determining a first parameter indicative of the complex amplitude of the first voltage on a first side of said load component connected to said device, and a second parameter indicative of the complex amplitude of said difference voltage or a calculated difference voltage comprising the difference between the first and second voltages; multiplying each of the first and second determined parameters by the complex conjugate of the second

determined parameter to generate third arid fourth parameters respectively; and comparing said third and fourth parameters to generate said output or comparing one or more components or derivatives of the third parameter and said fourth parameter. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 64, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output in dependence upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a test load component having a known impedance or at least one component of the impedance for connection in place of said device and in series with said load component for calibration of said load component; calibration processing means for processing the measurements when said test load component is connected in place of said device to determine and store a value dependent upon the impedance or at least one component of the impedance of the load component; and signal processing means for processing said measurements when said device is connected to generate an output in dependence upon the impedance or at least one component of the impedance of said device using the stored value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 70, none of the prior art of record teaches or suggests the combination of a proximity sensor for sensing the proximity of a target comprising: an analogue-to-digital converter for receiving a digital signal and for generating a proximity signal, wherein said processor is adapted to control said switch to switch to connect to said first and second ends of said impedance component sequentially; and a processor connected to the analogue-to-digital converter for receiving a digital voltage signal and for generating a proximity signal, wherein said processor is adapted to control said switch to switch to connect to said first and second ends of said impedance component sequentially. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Response to Arguments

9. Applicant's arguments with respect to claims 1-5,7,8,19,21-23,25,26,59-63,66,68,69 and 73-81 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H. Le whose telephone number is 571 272 2275. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571 272 2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

January 19, 2007

John Barlow
Supervisory Patent Examiner
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